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WHAT IS CLAIMED IS:

Related Pending Application
Related Case Serial No: 10/141,875
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1. A data communication apparatus that has a connecting means that can connect a plurality of image forming apparatuses, each having a counter for counting the number of formed images, regularly obtains counter
10 information representing values of the counters from the image forming apparatuses connected by said means, and regularly transmits, at longer intervals than an interval of obtaining the counter information, the obtained counter information with model number
15 information of the image forming apparatuses from which the counter information is obtained as maintenance contract management data to a central management apparatus that remotely controls the image forming apparatuses through a communication line such as a
20 public circuit, comprising:

model number information setting means for setting the model number information of the image forming apparatuses connected by the connecting means according to a requirement from the central management
25 apparatus;

counter information obtaining means for regularly obtaining the counter information representing the value of the counter from the image forming apparatuses by the connecting means;

5 a first memory and a second memory storing the counter information obtained by said means for each of the image forming apparatuses so as to correspond to the model number information that is previously set by the model number information setting means and matches the
10 model number information of the image forming apparatuses from which the counter information is obtained;

 counter information writing control means for, when obtaining the counter information by the counter
15 information obtaining means, prior to writing the counter information to the first memory, for the counter information of each of the image forming apparatuses obtained a previous time by the counter information obtaining means and already contained in the first
20 memory, moving the counter information contained in the first memory so as to correspond to the model number information that matches the model number information of the image forming apparatuses from which the counter information is obtained this time to the second memory
25 and writing the counter information to the second memory

so as to correspond to the model number information thereof for each of the image forming apparatuses, and thereafter writing the counter information obtained this time by the counter information obtaining means to the
5 first memory for each of the image forming apparatuses so as to correspond to the model number information that is previously set by the model number information setting means and matches the model number information of the image forming apparatuses from which the counter
10 information is obtained this time;

counter abnormality detecting means for comparing the counter information obtained this time by the counter information obtaining means with the counter information obtained the previous time, the model number
15 of the counter information thereof matching the model number of the image forming apparatuses from which the counter information is obtained this time, and detecting the counter information as counter abnormality when there is a contradiction between the counter information
20 obtained this time and the counter information obtained the previous time; and

counter abnormality information transmitting means for, when the counter abnormality is detected by said counter abnormality detecting means, transmitting
25 counter abnormality information to the central

management apparatus with each of the counter
information obtained this time and the counter
information obtained the previous time obtained by the
counter information obtaining means and the model number
5 information of the image forming apparatuses from which
the counter information is obtained this time.

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2. The data communication apparatus as
claimed in claim 1, further comprising:

counter information obtaining time setting
means for setting counter information obtaining time for
15 obtaining the counter information from the image forming
apparatuses connected by the connecting means according
to the requirement from the central management apparatus,
wherein, when the counter abnormality is
detected by the counter abnormality detecting means, the
20 counter abnormality information transmitting means
immediately transmits the counter abnormality
information to the central management apparatus with the
counter information obtained this time and the counter
information obtained the previous time by the counter
25 information obtaining means and the model number

information of the image forming apparatuses from which the counter information is obtained this time.

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3. The data communication apparatus as claimed in claim 1, wherein the counter abnormality information transmitting means transmits the counter abnormality information to the central management apparatus with the counter information obtained this time and the counter information obtained the previous time by the counter information obtaining means, the model number information of the image forming apparatuses from which the counter information is obtained this time and information of date and time of obtaining said counter information when the counter abnormality is detected by the counter abnormality detecting means.

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4. The data communication apparatus as claimed in claim 1, further comprising:
counter information clearing means for, in a

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case where the model number information is changed by setting of the model number information setting means, clearing the counter information contained in each of the first and second memories that correspond to the
5 model number information before the change.

10 5. The data communication apparatus as claimed in claim 1, further comprising:

counter information setting means for, after the counter abnormality information transmitting means transmits the counter abnormality information with the
15 counter information obtained this time and the counter information obtained the previous time by the counter information obtaining means, when receiving counter information setting requirement data that represents setting requirements of said counter information
20 including the counter value information and model number information from the central management apparatus, for the counter value information and model number information in the received counter information setting requirement data, transmitting the counter information
25 to the image forming apparatus corresponding to the

model number information and setting the counter value information to the counter.

5

6. The data communication apparatus as claimed in claim 1, wherein the contradiction between the counter information obtained this time and the counter information obtained the previous time corresponds to a case where the counter value represented by the counter information obtained this time by the counter information obtaining means is smaller than a counter value represented by the counter information obtained the previous time.

20 7. The data communication apparatus as claimed in claim 1, wherein the contradiction between the counter information obtained this time and the counter information obtained the previous time corresponds to a case where the counter value represented by the counter information obtained this time by the counter

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information obtaining means includes a character other than numbers.

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8. The data communication apparatus as claimed in claim 7, further comprising:

10 counter abnormality information transmission prohibiting means for prohibiting transmission to the central management apparatus by the counter abnormality information transmitting means in a case where the counter abnormality detecting means detects the counter
15 abnormality when the counter value represented by the counter information obtained this time also includes a character other than numbers in the same way as the counter information obtained the previous time by the counter information obtaining means.

20

9. A counter information transmission method
25 for a data communication apparatus that has a connecting

means that can connect a plurality of image forming
apparatuses, each having a counter for counting the
number of formed images, regularly obtains counter
information representing values of the counters from the
5 image forming apparatuses connected by said means, and
regularly transmits the obtained counter information
with model number information of the image forming
apparatuses from which the counter information is
obtained to a central management apparatus that remotely
10 controls the image forming apparatuses through a
communication line such as a public circuit, at longer
intervals than an interval of obtaining the counter
information, wherein, according to a requirement from
the central management apparatus, the model number
15 information of the image forming apparatuses connected
by the connecting means is previously set, when the
counter information representing the value of the
counter is regularly obtained from the image forming
apparatuses connected by the connecting means, prior to
20 writing the counter information to a first memory, for
the counter information for each of the image forming
apparatuses obtained at a previous time and already
contained in the first memory, the counter information
contained in the first memory so as to correspond to the
25 model number information that matches the model number

information of the image forming apparatuses from which
the counter information is obtained this time is moved
to a second memory and is written for each of the image
forming apparatuses so as to correspond to the model
5 number information, thereafter, the counter information
obtained this time is written to the first memory for
each of the image forming apparatuses so as to
correspond to the model number information that is
previously set and matches the model number information
10 of the image forming apparatuses from which the counter
information is obtained this time, and at the same time,
the counter information obtained this time is compared
with the counter information obtained the previous time
of which the model number information matches the model
15 number information of the image forming apparatuses from
which the counter information is obtained this time, the
counter information is detected as a counter abnormality
in a case where the counter value represented by the
counter information obtained this time is smaller than
20 the counter value represented by the counter information
obtained the previous time or where the counter value
represented by the counter information obtained this
time includes a character other than numbers, and
counter abnormality information is transmitted to the
25 central management apparatus with the counter

information obtained this time and the counter
information obtained the previous time, the model number
information of the image forming apparatuses from which
the counter information is obtained this time, and
5 information of date and time of obtaining said counter
information.

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10. The counter information transmission
method as claimed in claim 9, wherein transmission of
the counter abnormality information to the central
management apparatus is prohibited in a case where the
15 counter abnormality is detected when the counter value
represented by the counter information obtained this
time also includes the character other than numbers in
the same way as the counter information obtained the
previous time.

20

11. An image forming apparatus management
25 system comprising an image forming apparatus including a

counter for counting the number of formed images, a
central management apparatus that remotely controls the
image forming apparatus, and a data communication
apparatus that has a connecting means that can connect a
5 plurality of image forming apparatuses, regularly
obtains the counter information representing the values
of the counters from the image forming apparatuses
connected by said means, and regularly transmits the
obtained counter information with model number
10 information of the image forming apparatuses from which
the counter information is obtained as maintenance
contract management data to the central management
apparatus that remotely controls the image forming
apparatuses through a communication line such as a
15 public circuit at longer intervals than an interval of
obtaining the counter information, wherein the central
management apparatus comprises:

means for storing a database for containing
management data for remotely controlling the data
20 communication apparatus including the model number
information of the image forming apparatuses connected
by the connecting means of the data communication
apparatus;

model number information setting requirement
25 data transmitting means for transmitting model number

information setting requirement data including the model
number information of the image forming apparatuses
connected by the connecting means of the image forming
apparatuses and representing setting requirements of the
5 model number information;

 maintenance contract management data writing
means for, in a case when the maintenance contract
management data are received from the data communication
apparatus, for the counter information and model number
10 information in the data thereof, writing the counter
information for each of the image forming apparatuses to
the database so as to correspond to the model number
information that is contained in the database and
matches the model number information in the maintenance
15 contract management data; and

 counter abnormality information writing means
for, in a case where counter abnormality information is
received from the data communication apparatus, for the
counter information obtained this time and the counter
20 information obtained a previous time and model number
information in the counter abnormality information,
writing the counter information to the database so as to
correspond to the model number information that is
contained in the database and matches the model number
25 in the counter abnormality information, and the data

communication apparatus comprises:

model number information setting means for
setting the model number information of the image
forming apparatuses connected by the connecting means
5 according to a requirement from the central management
apparatus;

counter information obtaining means for
regularly obtaining the counter information representing
the value of the counter from the image forming
10 apparatuses by the connecting means;

a first memory and a second memory storing the
counter information obtained by said connecting means
for each of the image forming apparatuses so as to
correspond to the model number information that is
15 previously set by the model number information setting
means and matches the model number information of the
image forming apparatuses from which the counter
information is obtained this time;

counter information writing control means for,
20 when obtaining the counter information from the counter
information obtaining means, prior to writing the
counter information to the first memory, for the counter
information of each of the image forming apparatuses
obtained the previous time by the counter information
25 obtaining means and already contained in the first

memory, moving the counter information contained so as
to correspond to the model number information that
matches the model number information of the image
forming apparatuses from which the counter information
5 is obtained this time to the second memory and writing
the counter information to the second memory so as to
correspond to the model number information thereof for
each of the image forming apparatuses, and thereafter
writing the counter information obtained this time by
10 the counter information obtaining means to the first
memory for each of the image forming apparatuses so as
to correspond to the model number information that is
previously set by the model number information setting
means and matches the model number information of the
15 image forming apparatuses from which the counter
information is obtained this time;

counter abnormality detecting means for
comparing the counter information obtained this time by
the counter information obtaining means with the counter
20 information obtained the previous time, the model number
of the counter information thereof matching the model
number of the image forming apparatuses from which the
counter information is obtained this time, and detecting
the counter information as counter abnormality when
25 there is contradiction between the counter information

obtained this time and the counter information obtained
the previous time; and

counter abnormality information transmitting
means for, when the counter abnormality is detected by
5 said counter abnormality detecting means, transmitting
the counter abnormality information to the central
management apparatus with the counter information
obtained this time and the previous time by the counter
information obtaining means and the model number
10 information of the image forming apparatuses from which
the counter information is obtained this time.

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12. The image forming apparatus management
system as claimed in claim 11, wherein the central
management apparatus comprises counter information
obtaining time setting requiring data transmitting means
20 for transmitting counter information obtaining time
setting requiring data that represents setting
requirements and includes counter information obtaining
time for obtaining the counter information from the
image forming apparatuses connected by the connecting
25 means of the data communication apparatus, the data

communication apparatus comprises counter information
obtaining time setting means for, in a case where the
counter information obtaining time setting requiring
data is received from the central management apparatus,
5 setting the counter information obtaining time included
in the counter information obtaining time setting
requiring data, and the counter abnormality information
transmitting means of the data communication apparatus
for immediately transmitting the counter abnormality
10 information to the central management apparatus with the
counter information obtained this time and the counter
information obtained the previous time by the counter
information obtaining means and the model number
information of the image forming apparatuses from which
15 the counter information is obtained this time in a case
where the counter abnormality detecting means detects
the counter abnormality.

20

13. The image forming apparatus management
system as claimed in claim 11, wherein the counter
abnormality information transmitting means of the data
25 communication apparatus transmits the counter

abnormality information to the central management
apparatus with the counter information obtained this
time and the counter information obtained the previous
time by the counter information obtaining means, the
5 model number information and information of date and
time of obtaining said counter information in a case
where the counter abnormality detecting means detects
the counter abnormality.

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14. The image forming apparatus management
system as claimed in claim 11, wherein the data
15 communication apparatus further comprises counter
information clearing means for, in a case where the
model number information is changed by setting of the
model number information setting means, clearing the
counter information contained in each of the first and
20 second memories that correspond to the model number
information before the change.

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15. The image forming apparatus management system as claimed in claim 11, wherein the data communication apparatus comprises counter information setting means for, after the counter

5 abnormality information transmitting means transmits the counter abnormality information with each of the counter information obtained this time and the counter information obtained the previous time by the counter information obtaining means, when receiving counter

10 information setting requirement data that represents setting requirements of said counter information including the counter value information and model number information from the central management apparatus, for the counter information and model number information in

15 the received counter information setting requirement data, transmitting the counter information to the image forming apparatus corresponding to the model number information and setting the counter information to the counter, and the central management apparatus comprises

20 counter information setting requiring data transmitting means for, for the counter information written to and contained in the database by the counter abnormality information writing means, transmitting counter information setting requiring data that represents

25 setting requirements of the counter information

including newest and correct counter information and the model number information stored so as to correspond to the counter information.

5

16. The image forming apparatus management system as claimed in claim 11, wherein the contradiction
10 between the counter information obtained this time and the counter information obtained the previous time of the data communication apparatus corresponds to a case where the counter value represented by the counter information obtained this time by the counter
15 information obtaining means is smaller than the counter value represented by the counter information obtained the previous time.

20

17. The image forming apparatus management system as claimed in claim 11, where in the contradiction between the counter information obtained
25 this time and the counter information obtained the

previous time of the data communication apparatus
corresponds to a case where the counter value
represented by the counter information obtained this
time by the counter information obtaining means includes
5 a character other than numbers.

10 18. The image forming apparatus management
system as claimed in claim 17, wherein the data
communication apparatus further comprises counter
abnormality information transmission prohibiting means
for prohibiting transmission to the central management
15 apparatus by the counter abnormality information
transmitting means in a case where the counter
abnormality detecting means detects the counter
abnormality when the counter value represented by the
counter information obtained this time also includes a
20 character other than numbers in the same way as the
counter information obtained the previous time by the
counter information obtaining means.

ABSTRACT OF THE DISCLOSURE

A data communication apparatus regularly obtains counter information from a plurality of image forming apparatuses. Then, the data communication
5 apparatus moves and writes the counter information that is in a first memory and obtained at a previous time to a second memory. Thereafter, the counter information obtained this time is written to the first memory. At the same time, the data communication apparatus compares
10 the counter information obtained this time with the counter information obtained the previous time. When there is a contradiction between both sets of counter information, the counter information is determined to be a counter abnormality and transmitted to a central
15 management apparatus.



FIG.1

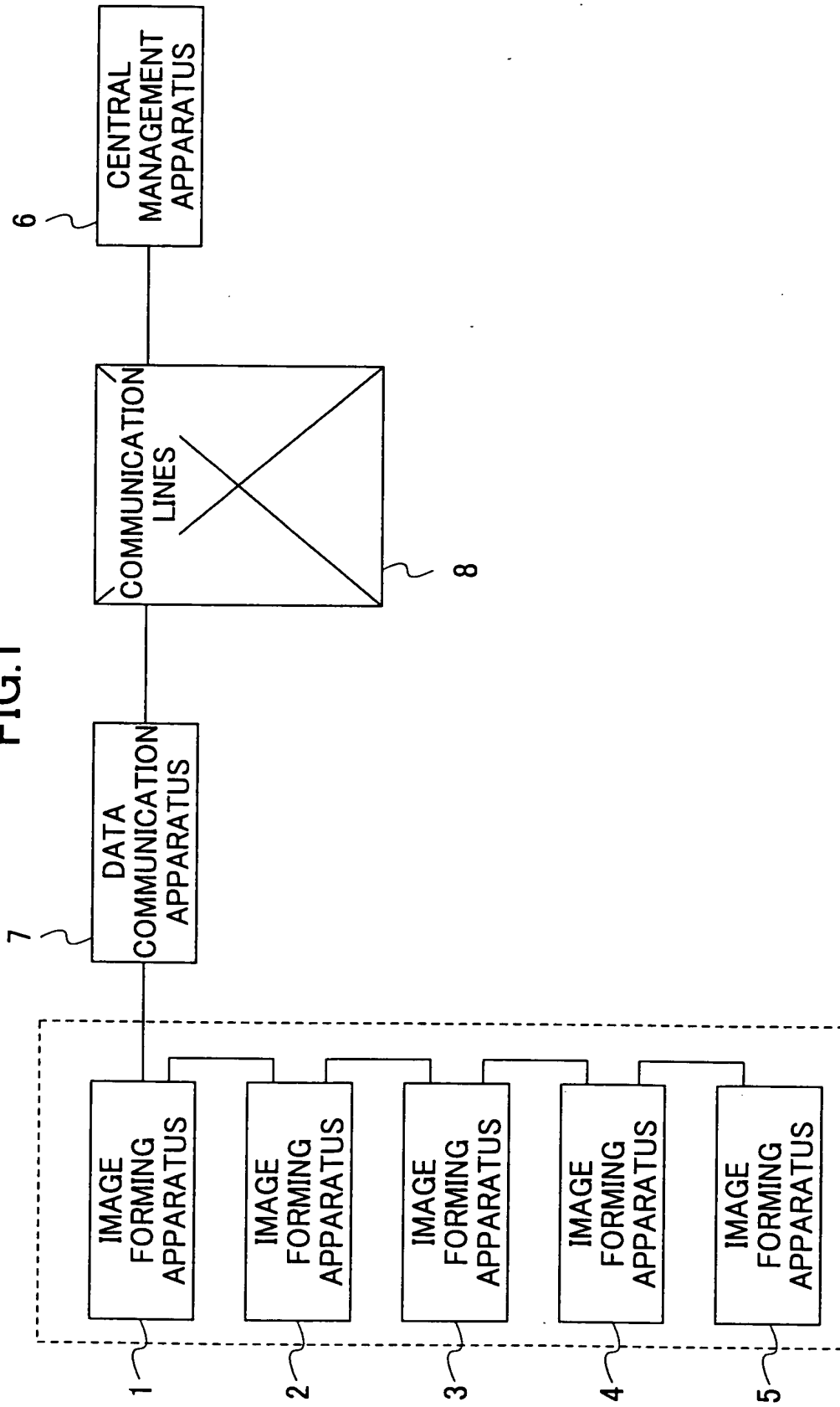


FIG.2

1~5

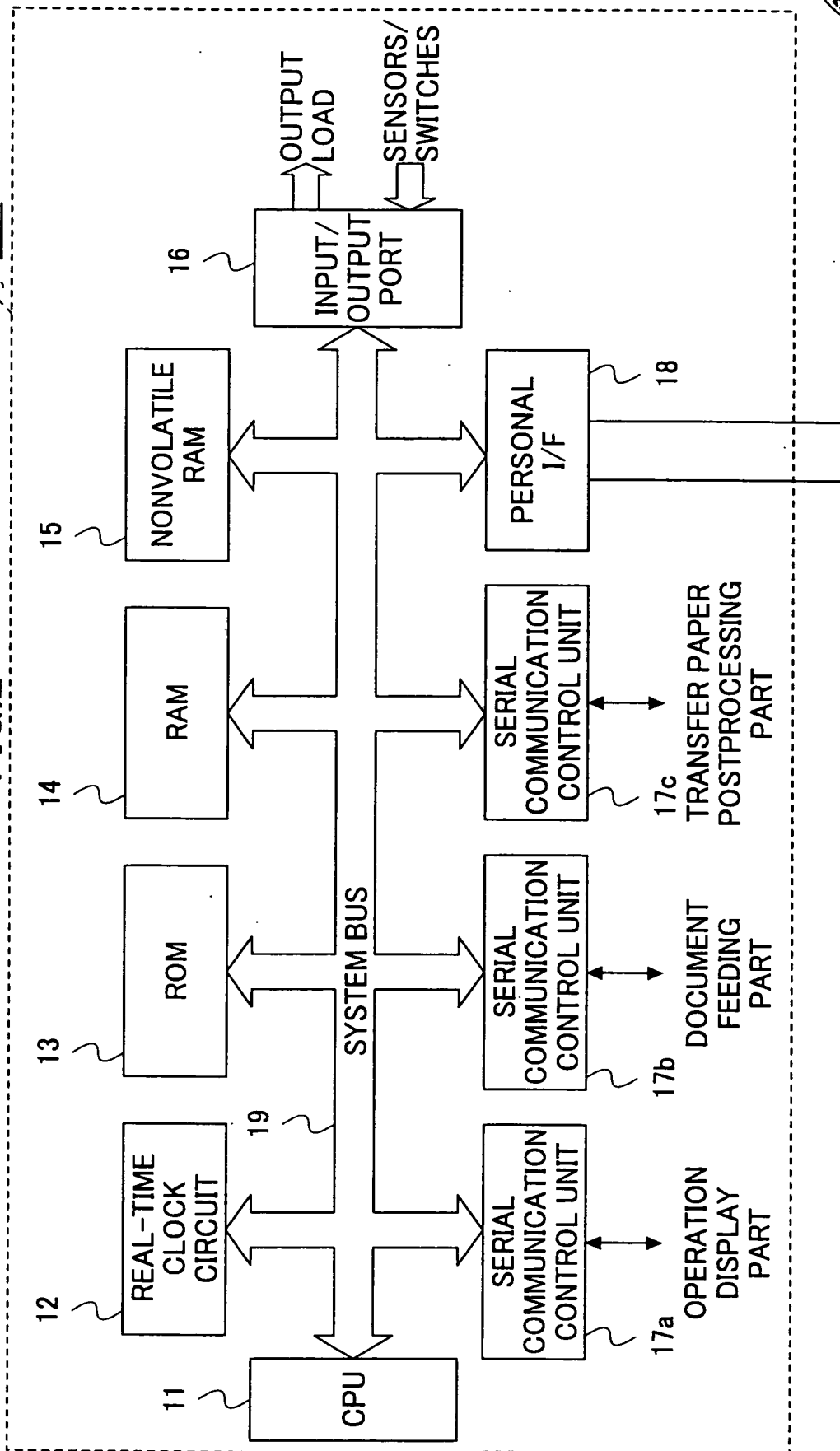




FIG.3

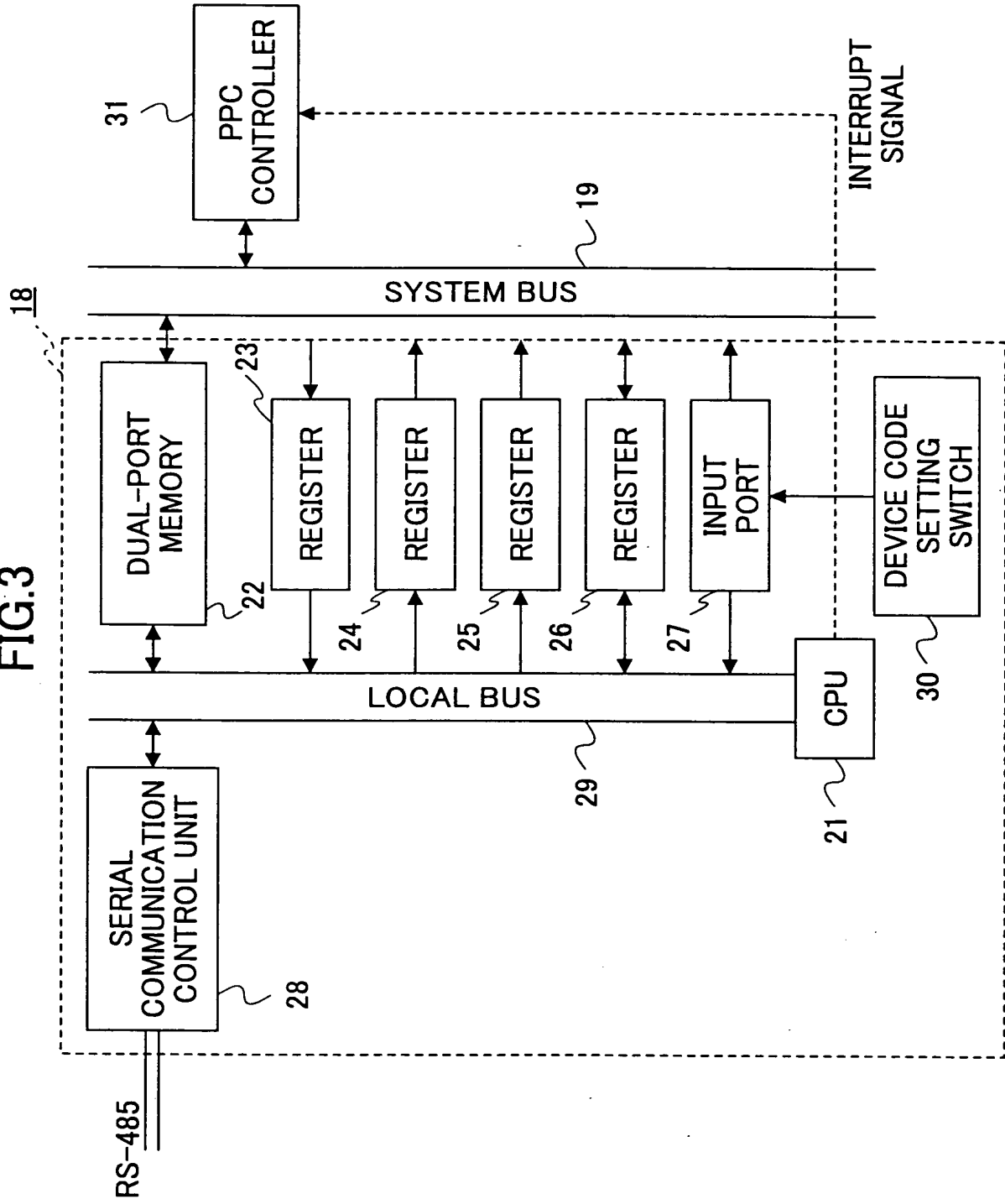




FIG.4

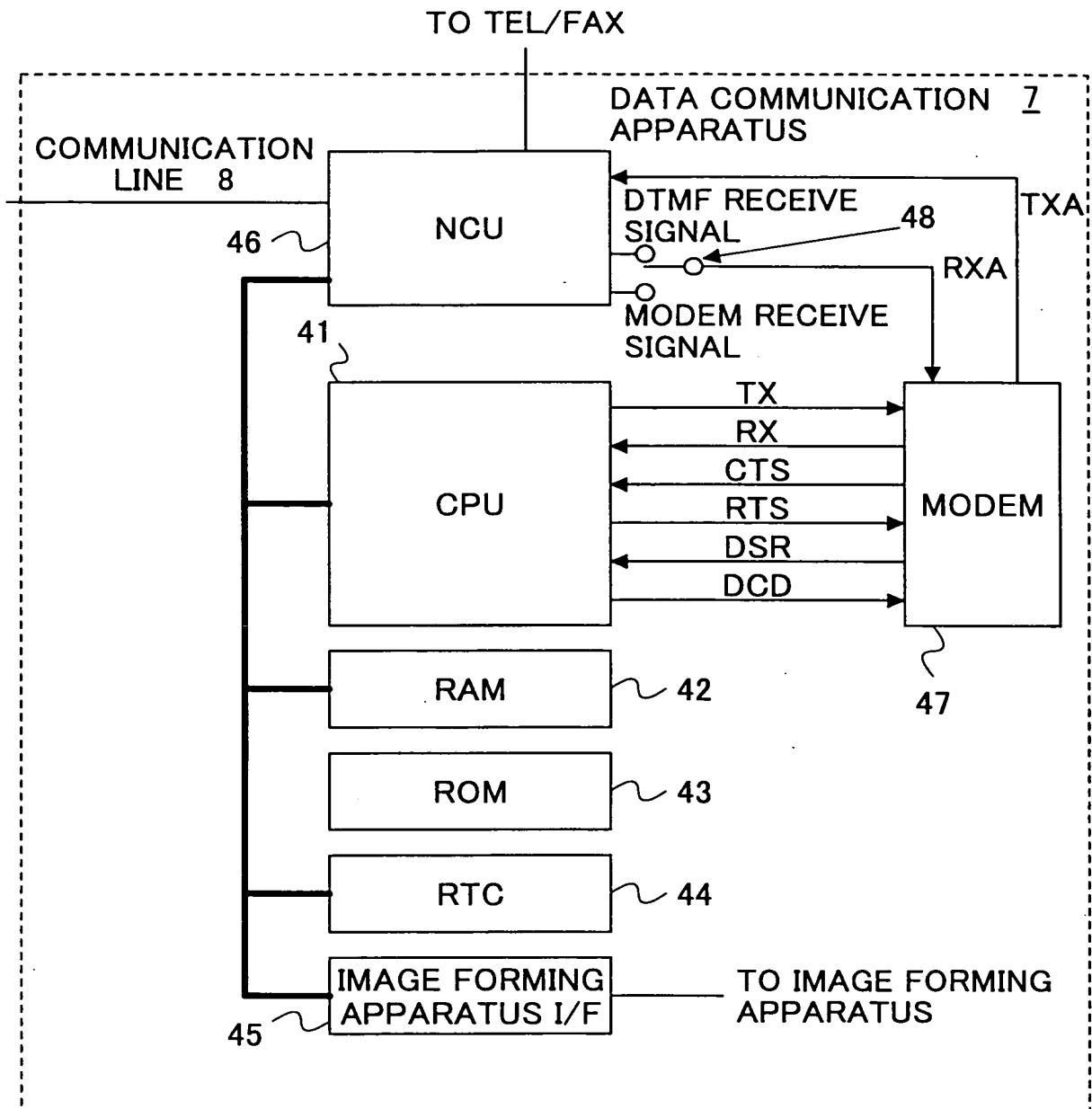




FIG.5

PARAMETERS IN DATA COMMUNICATION APPARATUS

No.	PARAMETER NAME
1	TELEPHONE NUMBER FOR SC/MC
2	WAITING TIME FOR REDIALING FOR SC/MC
3	NUMBER OF TIMES OF REDIALING FOR SC/MC
4	TELEPHONE NUMBER FOR ALARM CALL
5	WAITING TIME FOR REDIALING FOR ALARM CALL
6	NUMBER OF TIMES OF REDIALING FOR ALARM CALL
7	TELEPHONE NUMBER FOR BLOCK BILLING
8	WAITING TIME FOR REDIALING FOR BLOCK BILLING
9	NUMBER OF TIMES OF REDIALING FOR BLOCK BILLING
10	PPC MODEL NUMBER OF DEVICE ADDRESS 0
11	PPC MODEL NUMBER OF DEVICE ADDRESS 1
12	PPC MODEL NUMBER OF DEVICE ADDRESS 2
13	PPC MODEL NUMBER OF DEVICE ADDRESS 3
14	PPC MODEL NUMBER OF DEVICE ADDRESS 4
15	COUNTER CLOSING DAY OF DEVICE ADDRESS 0
16	COUNTER CLOSING DAY OF DEVICE ADDRESS 1
17	COUNTER CLOSING DAY OF DEVICE ADDRESS 2
18	COUNTER CLOSING DAY OF DEVICE ADDRESS 3
19	COUNTER CLOSING DAY OF DEVICE ADDRESS 4
20	ALARM CALL REPORTING TIME
21	BLOCK BILLING CALL REPORTING TIME
22	COUNTER CALL REPORTING TIME



FIG.6

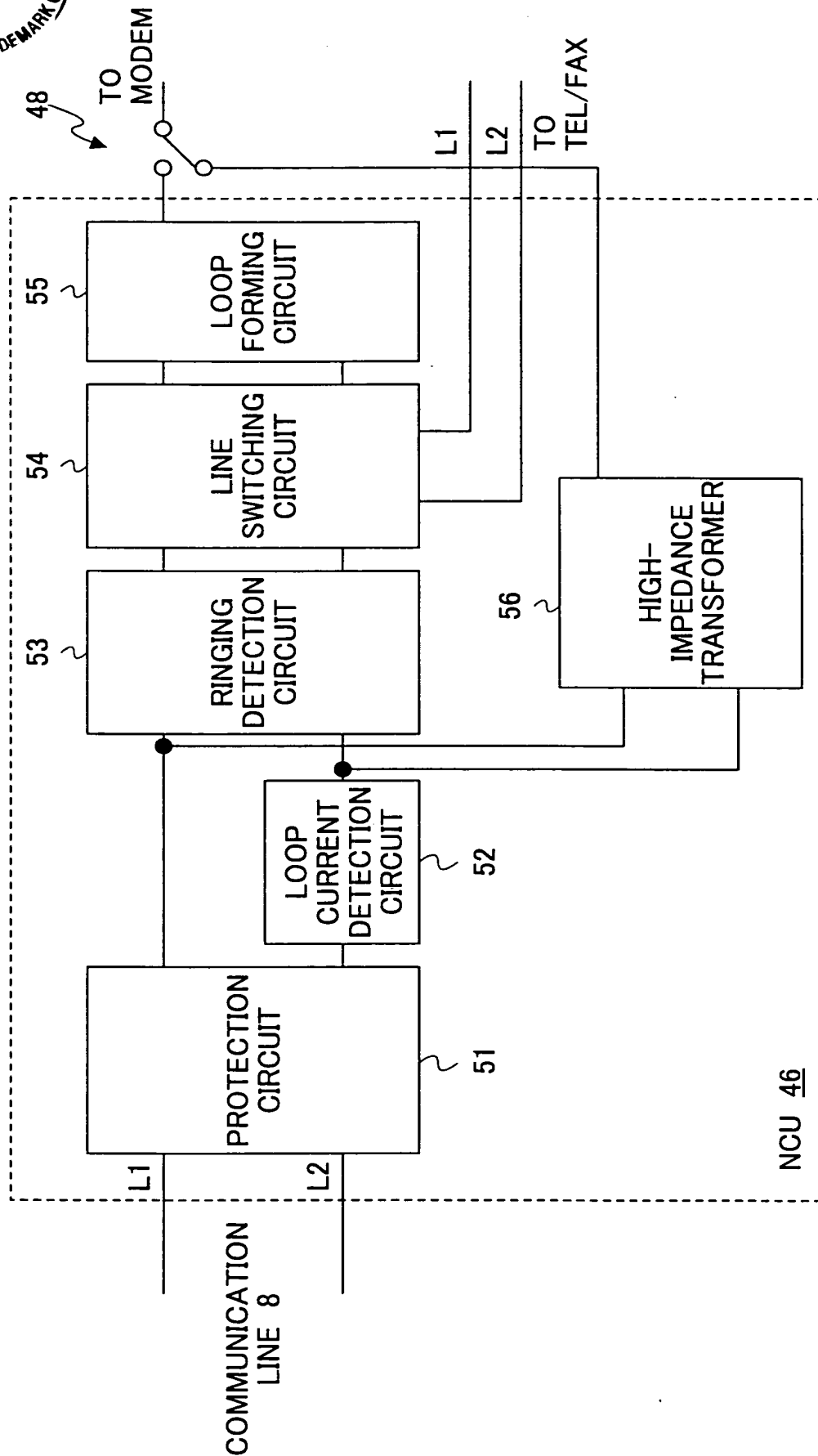




FIG.7

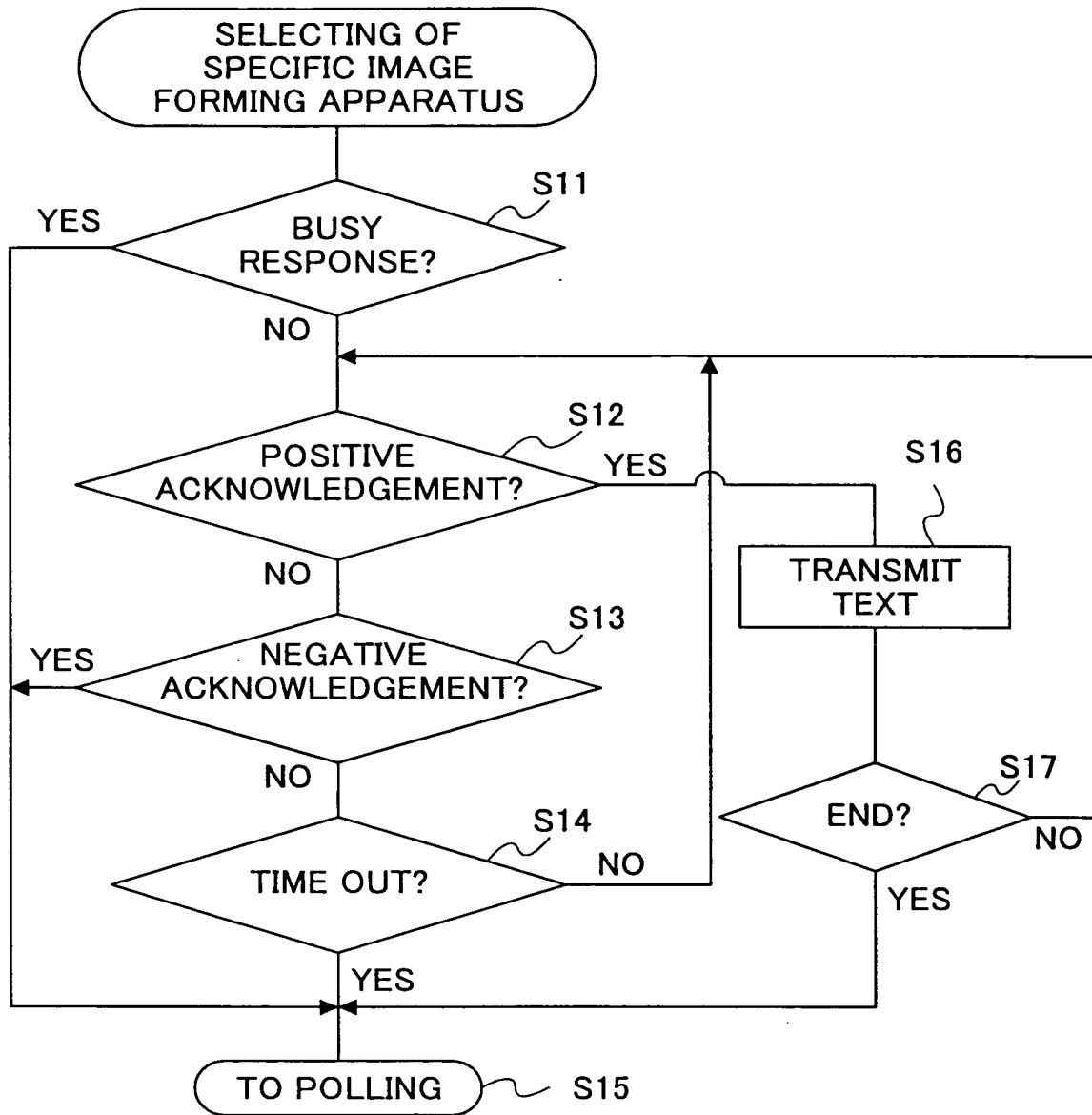


FIG.8

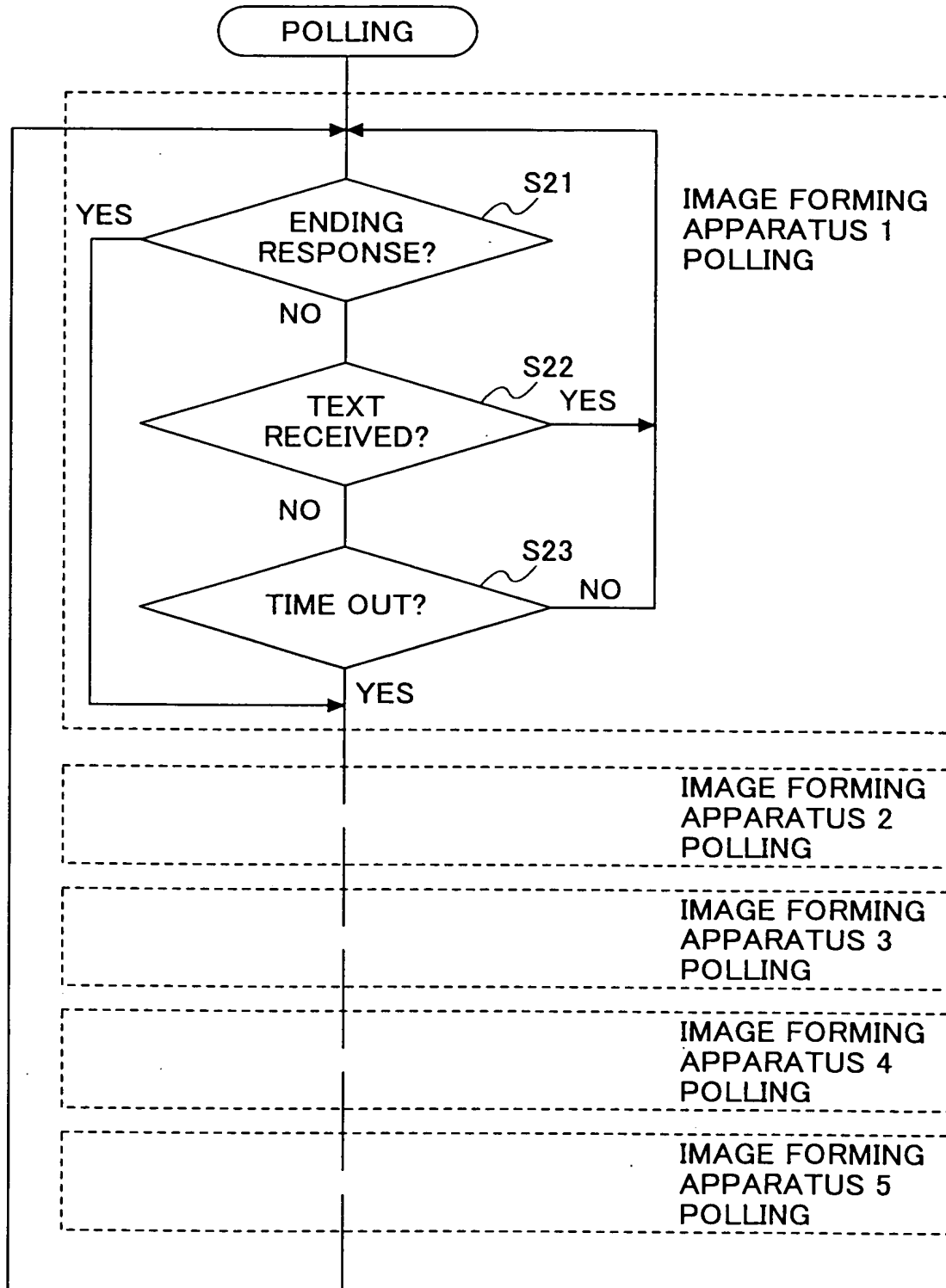


FIG.9

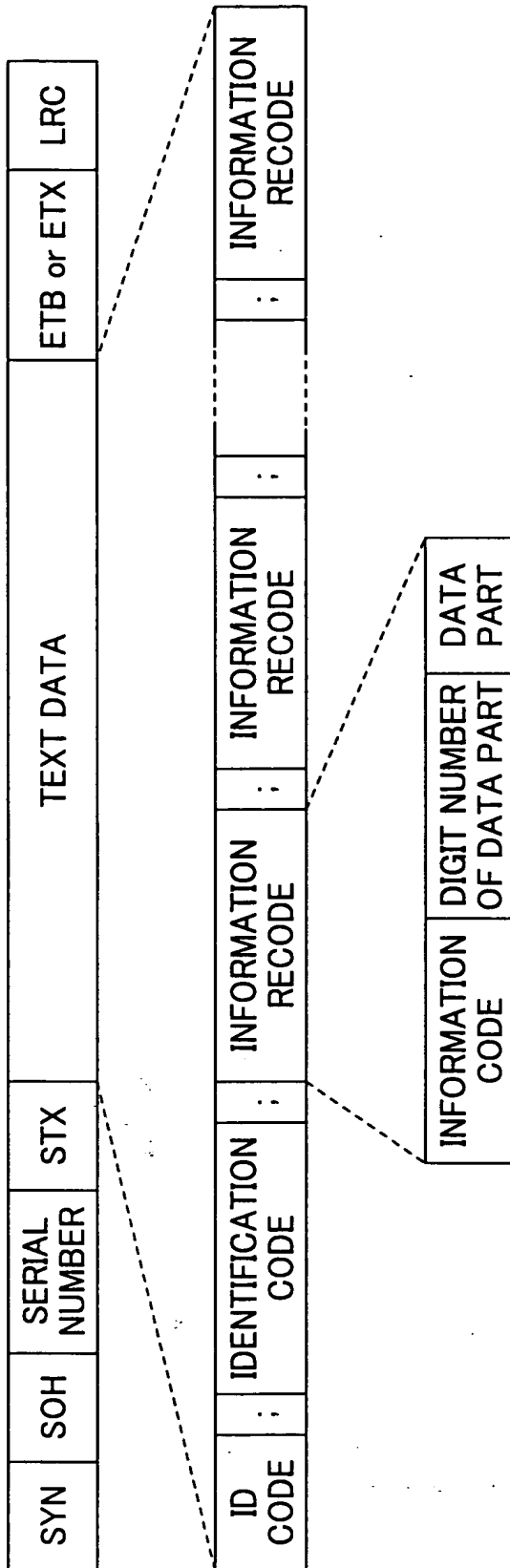


FIG.10

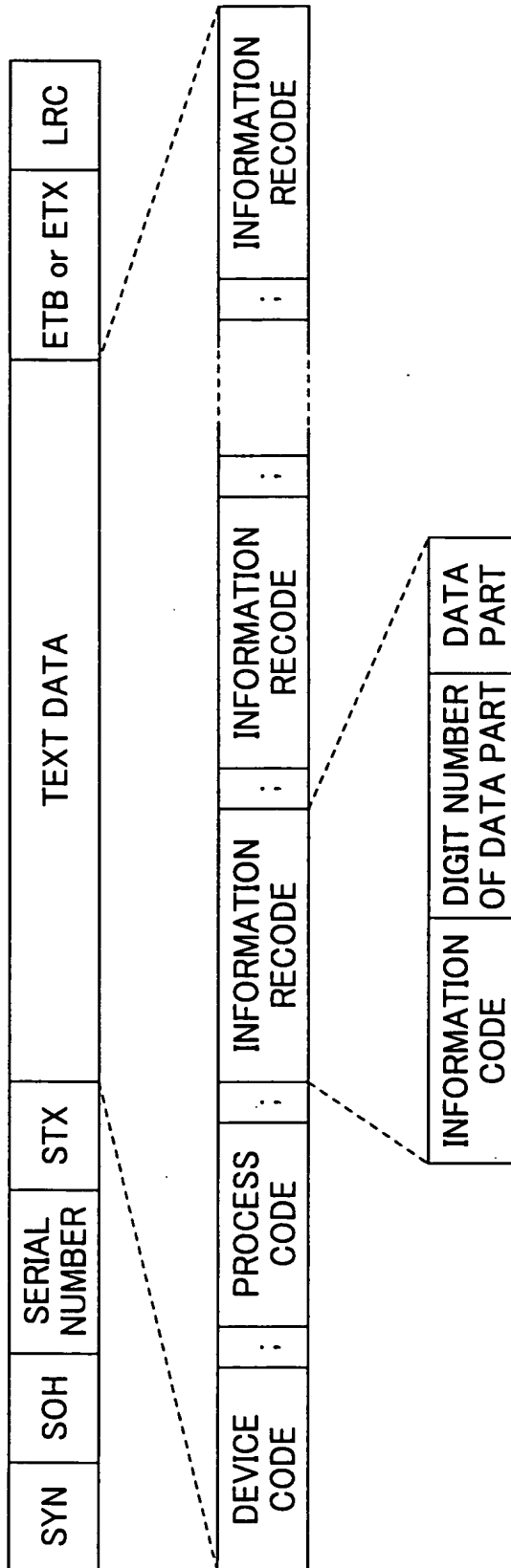


FIG.11

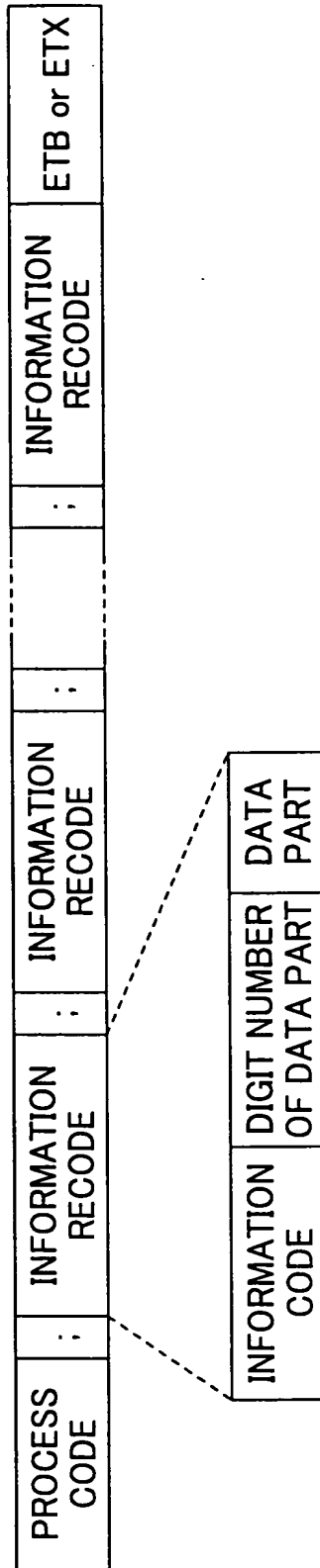


FIG.12

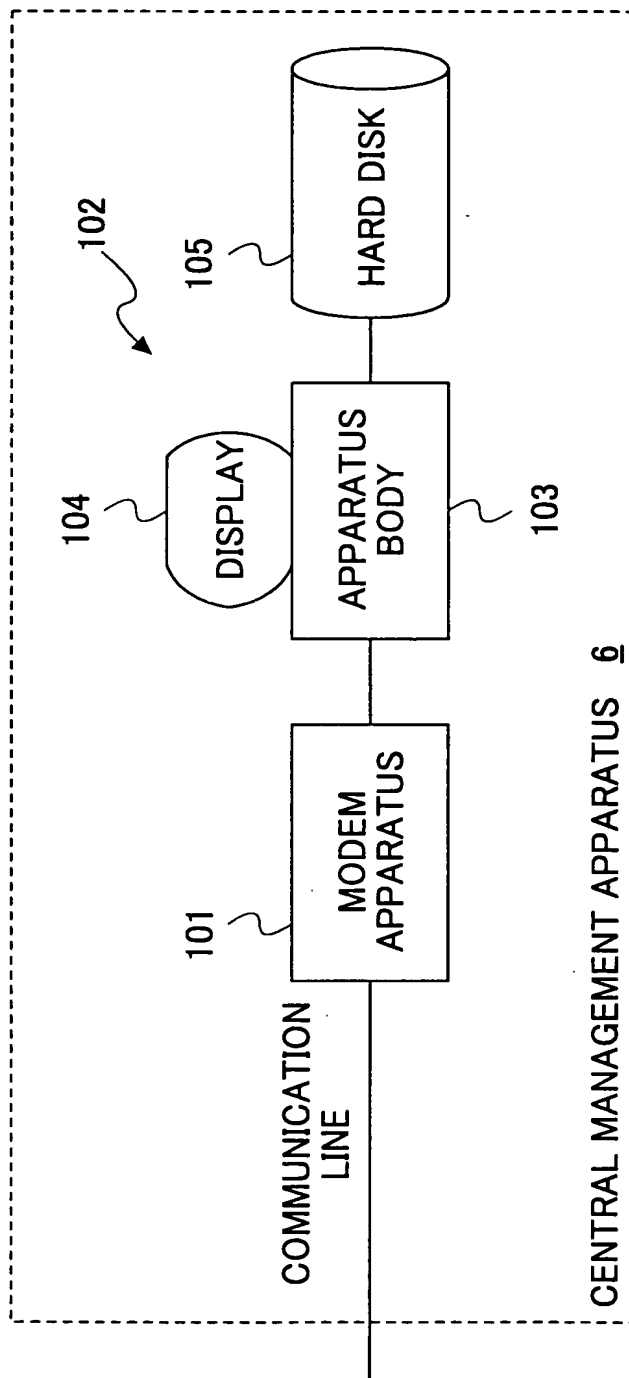


FIG.13

MANAGEMENT DATA OF DB IN CENTRAL MANAGEMENT APPARATUS

CUSTOMER ID	PPCID	COUNTER INFORMATION OF PREVIOUS TIME		COUNTER INFORMATION OF THIS TIME	
		DATE AND TIME OF RECEIPT	COUNTER VALUE	DATE AND TIME OF RECEIPT	COUNTER VALUE
03-3778- 7705	3210-110012	010325 22:03	00123456	0100425 22:03	00125678
03-3210- 9876	3310-110123	010325 22:04	00654321	0100425 22:04	00654654
....
....



FIG.14

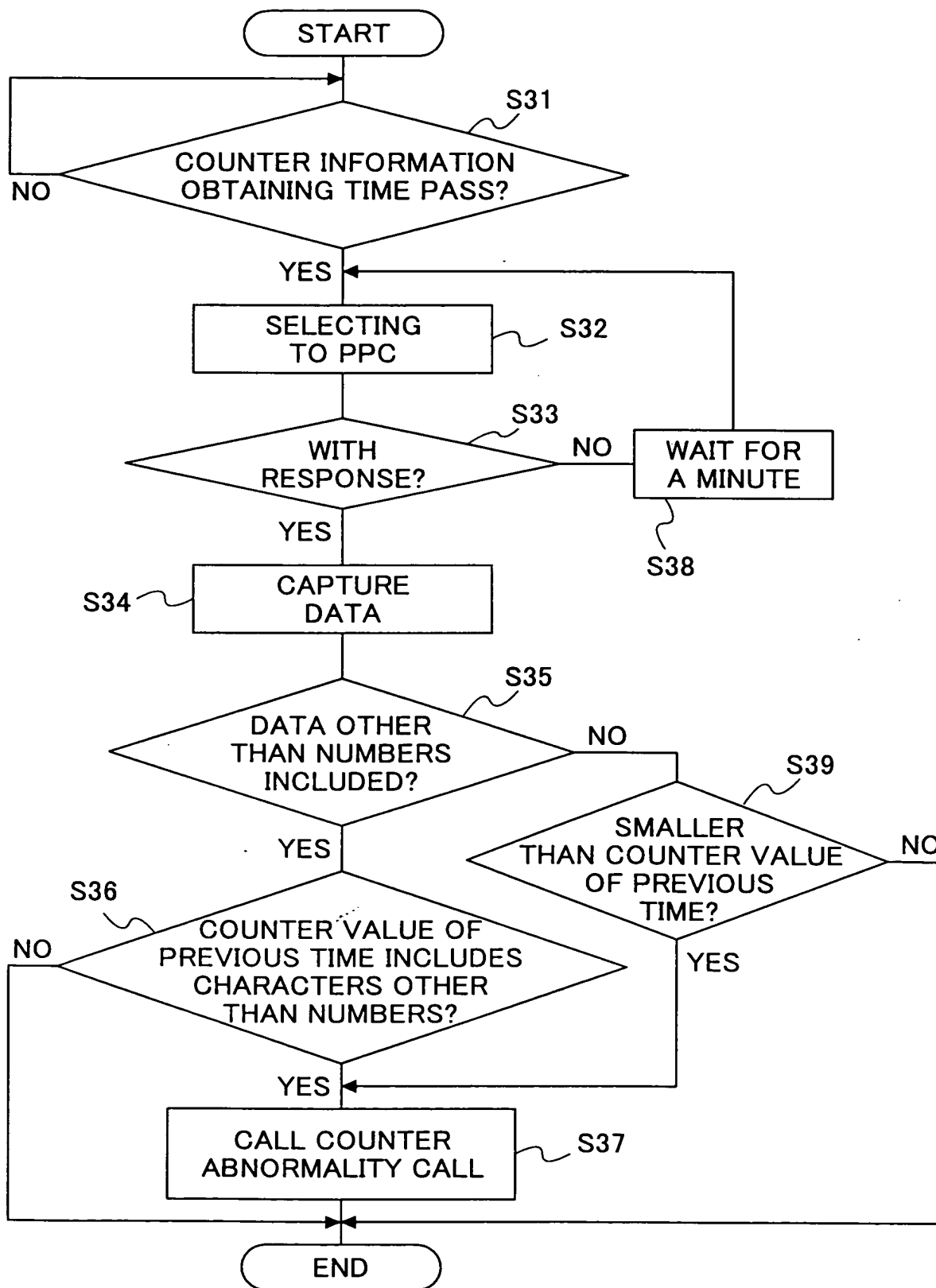


FIG.15

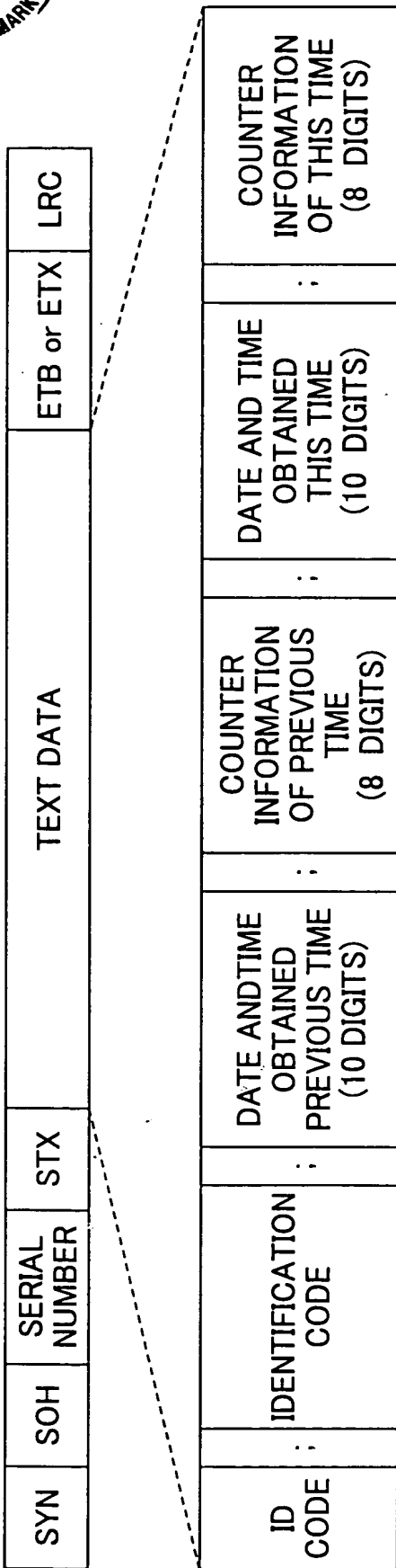


FIG.16

